## We claim:

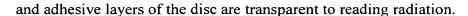
- 1. Optical data storage and reading device comprising:
- a multilayer fluorescent information-carrying optical disc;
- **a** source of reading radiation;
- 5 means for focusing the reading radiation into a micro-spot of the multilayer disc;
  - means for spatially separating the reading radiation from information-carrying radiation; and
  - means for detecting an availability of bit information in the micro-spot.
  - 2. Device according to claim 1, wherein the means for spatially separating comprises a spectrum filter.
  - 3. Device according to claim 2, wherein the spectrum filter comprises a dichroic filter.
  - 4. Device according to claim 2, wherein the spectrum filter comprises a smectic liquid crystal.
  - 5. Device according to claim 2, wherein the spectrum filter comprises a Notch filter.
  - 6. Device according to claim 5, wherein the Notch filter is a liquid crystal Notch filter.
  - 7. Device according to claim 5, wherein the Notch filter is a Notch filter tuned over a spectrum.
  - 8. Device according to claim 1, wherein the means for spatially separating comprises a polarization removable film polarizer.
- 9. Device according to claim 1, wherein the means for spatially separating comprises an electrically controlled polarization filter of a Pockels cell type.
  - 10. Device according to claim 1, further comprising a light controlling element for increasing an amount of the information-carrying radiation which reaches the detector.
- 11. Device according to claim 10, wherein the light-collecting element is located on a non-readable side of the fluorescent disc.
  - 12. Device according to claim 10, wherein the light-collecting element comprises an angle mirror.
  - 13. Device according to claim 10, wherein the light-collecting element comprises a pyramidal light-collecting element.
- 30 14. Device according to claim 12, wherein the angle mirror is made as a separate element.

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- 15. Device according to claim 12, further comprising a device for following a displacement of the angle mirror.
- 16. Device according to claim 12, wherein the angle mirror consists of plurality of microangle mirrors.
- 17. Device according to claim 12, wherein the angle mirror is located directly on a surface of the fluorescent disc.
  - 18. Device according to claim 16, wherein the plurality of said micro-angle mirrors are located on a back surface of the fluorescent disc.
  - 19. Device according to claim 16, wherein a geometrical size of each of said micro-angle mirrors is much less than a spot size of the micro-spot.
    - 20. Device according to claim 1, further comprising a compensating electronic device for compensating for an influence of dye fluorescence lifetime.
    - 21. Device according to claim 20, wherein the compensating electronic device is located in an electric output scheme of the detector.
    - 22. Device according to claim 1, wherein the means for spatially separating is located in front of the detector.
    - 23. Device according to claim 1, wherein the detector comprises a first detector for detecting the information-carrying radiation when the information-carrying radiation has a wavelength equal to a wavelength of the reading radiation and a second detector for detecting the information-carrying radiation when the information-carrying radiation has a wavelength different from the wavelength of the reading radiation.
    - 24. Device according to claim 23, wherein the means for spatially separating comprises an optical element for directing the information-carrying radiation to one of the first detector and the second detector in accordance with the wavelength of the information-carrying radiation.
- 25. Device according to claim 24, wherein the optical element is a dichroic mirror.
  - 26. Device according to claim 24, wherein the optical element is a movable filter.
  - 27. A multilayer hybrid fluorescent optical disc, comprising a substrate and successively located information-carrying layers (surfaces), spatially divided by polymer layers and assembled together in a single unit by adhesive layers and covered with a protective layer from the substrate back side.
  - 28. Fluorescent optical disc according to claim 27, wherein the substrate, said intermediate

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- 29. Fluorescent optical disc according to claim 27 with said intermediate layers of 10-300 µm thick.
- 30. Fluorescent optical disc according to claim 27, wherein said information-carrying layers comprise surfaces with optically detectable marks (pits).
- 31. Fluorescent optical disc according to claim 30, wherein the optically detectable marks are fluorescent.
- 32. Fluorescent optical disc according to claim 31, wherein the information-carrying layers are constructed such that an intensity of a detected signal is constant and independent of a distance of each information layer from the disc surface.
- 33. Fluorescent optical disc according to claim 32, wherein an absorption of fluorescent information marks grows with increasing layer number.
- 34. Fluorescent optical disc according to claim 30, wherein each optically detectable mark is 0.6 µm wide.
- 35. Fluorescent optical disc according to claim 31, wherein each information-carrying surface is covered with a continuous layer of a fluorescent substance which has a largest thickness above the information-carrying pits comparatively to regions outside pits.
- 36. Fluorescent optical disc according to claim 31, wherein each information-carrying layer comprises a fluorescent substance which fills only the pits.
- 37. Fluorescent optical disc according to claim 27, wherein all the said layers of multilayer disc are fluorescent ROM layers.
- 38. Fluorescent optical disc according to claim 37, wherein at least one fluorescent layer is of WORM or RW type.
- 39. Fluorescent optical disc according to claim 30, wherein all the layers have nearly the same refraction index.
- 40. Fluorescent optical disc according to claim 27, wherein the intermediate layers are made from photo-cured liquid compositions.
- 41. Fluorescent optical disc according to claim 27, wherein liquid photo-polymerized intermediate layers also serve as adhesive layers.
- 42. Fluorescent optical disc according to claim 27, wherein dry photopolymer films serve as intermediate layers.

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- 43. Fluorescent optical disc according to claim 27, further comprising reflective ROM, WORM or RW layers.
- 44. Fluorescent optical disc according claim 43, wherein said reflective layers are located behind the fluorescent layers.
- 5 45. Fluorescent composition for a hybrid fluorescent optical disc, comprising
  - One or more polymerized liquid low-volatile components
  - Solvent, consisting of one or more components
  - Polymerization catalysts
  - One or more substances, capable to fluoresce
  - Additives, improving homogeneity of luminophores' distribution in the composition.
  - 46. Composition according to claim 45, wherein the said polymerizing component is optically or radio-chemically cured.
  - 47. Composition according to claim 45, wherein the said polymerizing component is thermally cured.
  - 48. Composition according to claim 45, wherein solvent has vapors which are more volatile than said liquid polymerized components' vapors.
  - 49. Composition according to claim 45, wherein the solvent contains components with reactive a functional groups capable of being polymerized together with the said polymerizing components.
  - 50. Composition according to claim 45, wherein the said luminophore contains components with reactive functional groups capable of being polymerized together with the said polymerizing components.
  - 51. Method of obtaining a hybrid fluorescent optical disc, comprising subsequent layer-by-layer forming of said information-carrying layers with microrelief like pits or spiral grooves, filling of ROM, WORM or RW microrelief with said fluorescent material and their assembling them together to form a multilayer structure.

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